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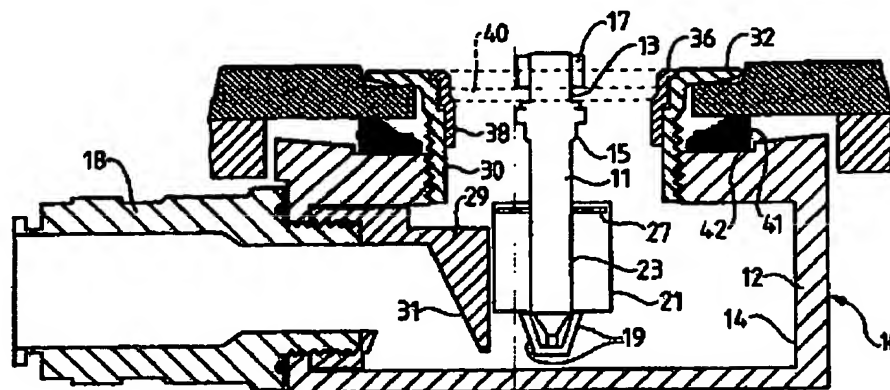
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(57) A shower drain trap comprises a receptacle (10) having a wall surround (12) defining a chamber (14). The receptacle (10) is to be fitted under a drain outlet (16) and in communication therewith. An outlet pipe (18) is plumbed into the receptacle (10) and associated with a pump. A float switch (20) is accommodated in the chamber (14) and comprises a float member (21, 22) mounted on an elongate element (11, 24) and adapted for restricted movement relevant thereto. The elongate element (11, 24) has contact points in electric circuit with power means and the pump. The contact points are to be made or broken by the position of the float member (21, 22) relative to the elongate element (11, 24) and depending on whether water is present in the receptacle (10) or not.

**FIG. 1****GB 2 361 419 A**

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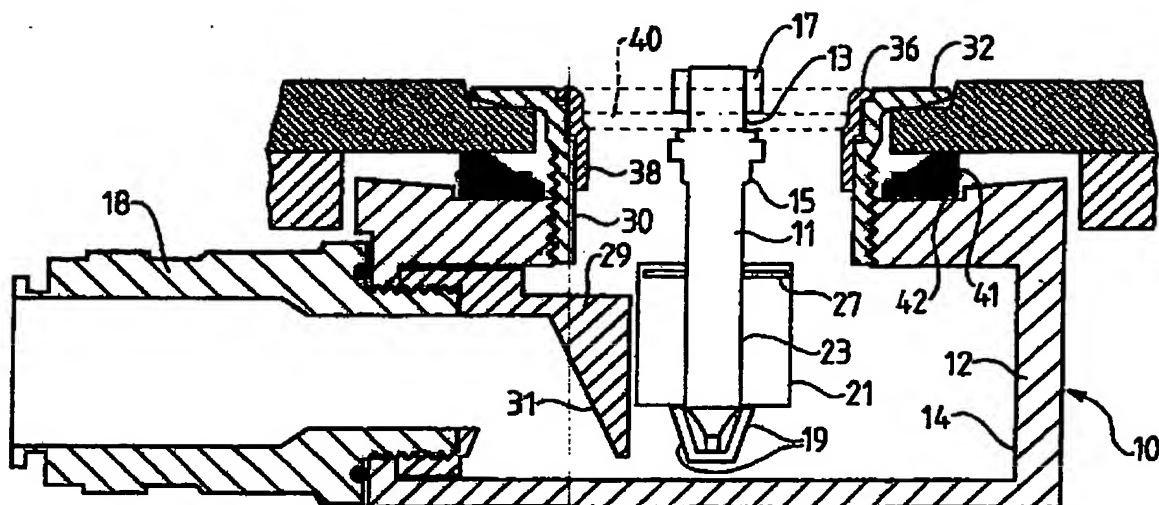


FIG. 1

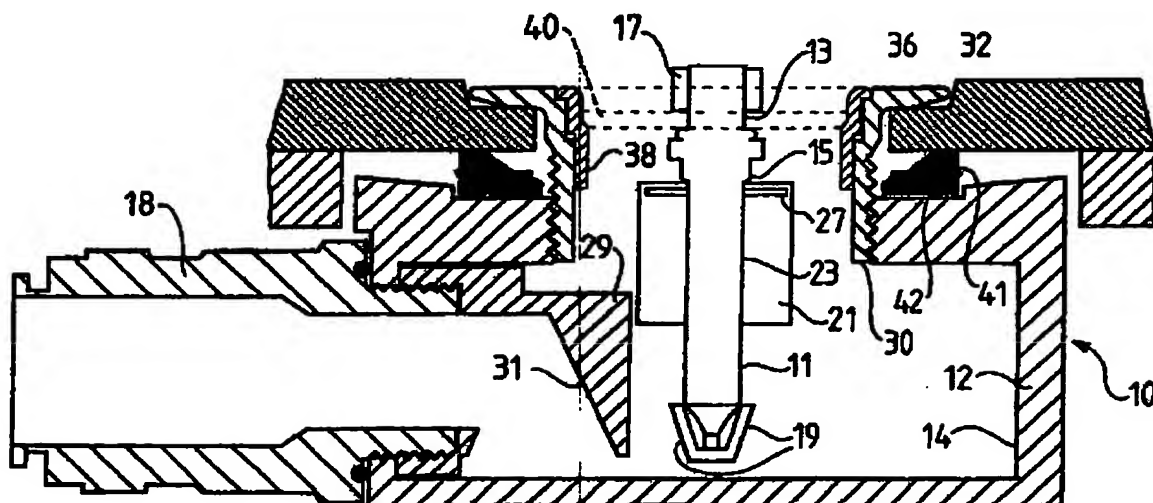


FIG. 2

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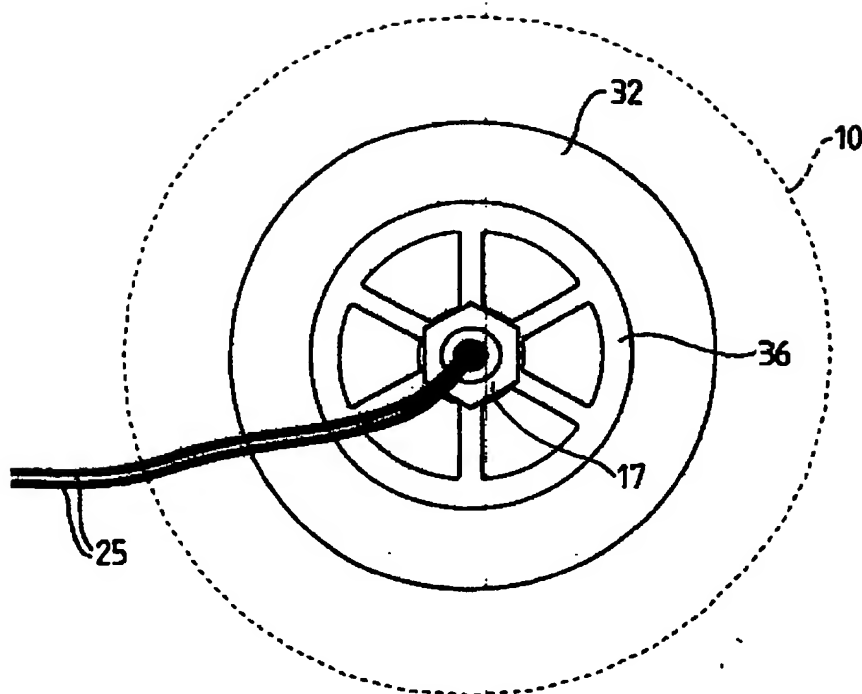
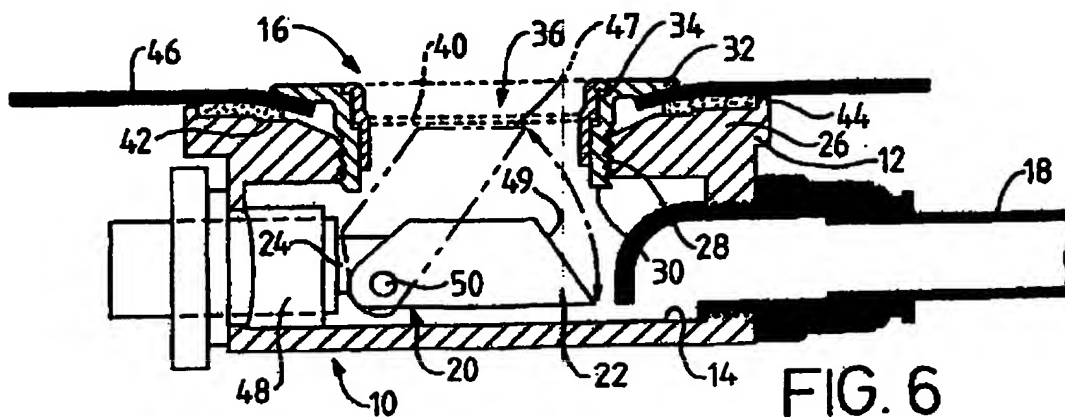
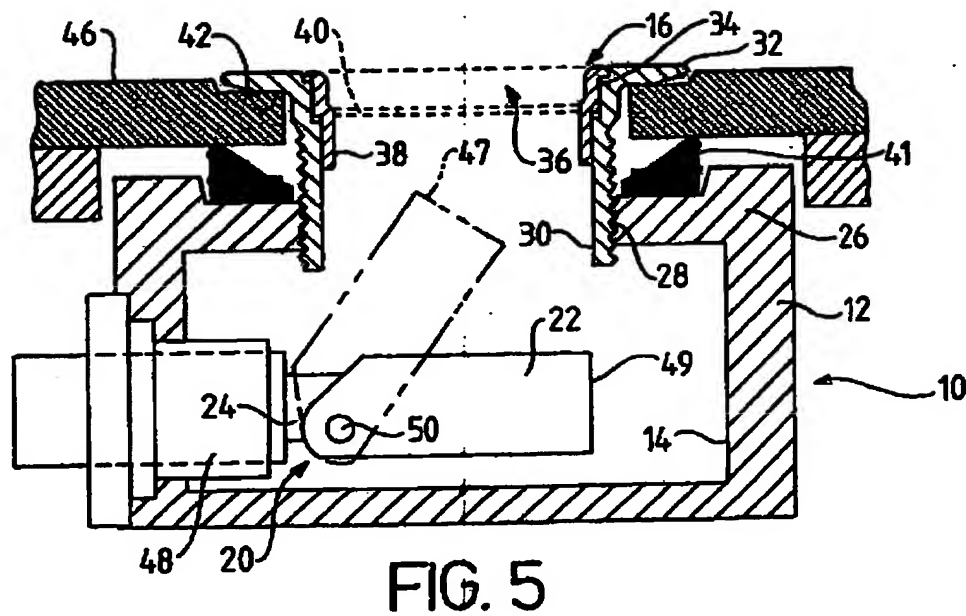
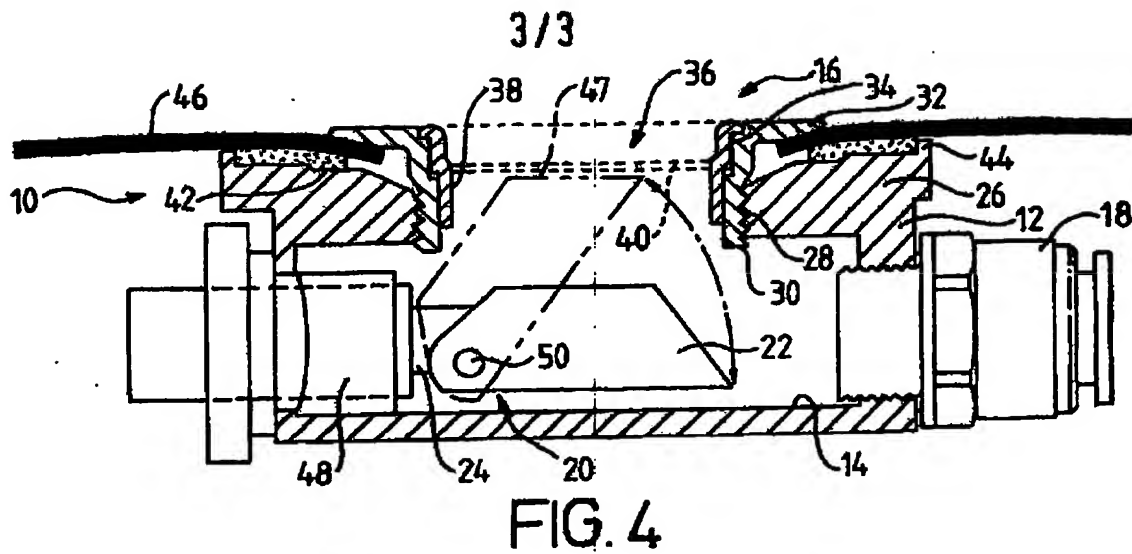


FIG. 3



2361419**SHOWER DRAIN TRAP**

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This invention relates to a shower drain trap to be fitted under an outlet drain of a shower and into which an outlet pipe is fitted. In some instances, a pump is fitted in communication with the outlet pipe to suck waste water from the trap. If there is not sufficient water in the trap, a combination of air and water is drawn into the outlet pipe. This results in noise being created which can be unacceptable to the user and is therefore a disadvantage.

An object of the present invention is to obviate or mitigate this disadvantage.

Accordingly, the present invention is a shower drain trap comprising a receptacle having a wall surround defining a chamber, the receptacle to be fitted under a drain outlet and in communication therewith, an outlet pipe plumbed into the receptacle and associated with the pump, a float switch being accommodated in the chamber of the receptacle and comprising a float member mounted on an elongate element and adapted for restricted movement relevant thereto, the elongate element having contact points in electric circuit with power means and the pump, the contact points to be made or broken by the position of the float member relative to the elongate element and depending on whether water is present in the receptacle or not.

Preferably, the receptacle is of shallow cylindrical shape with closed ends and oriented with its axis upright, the top end having a central threaded aperture into which is fitted a tubular mounting of the drain outlet, the tubular mounting having an external thread to engage with the threaded aperture and at its upper end an annular flange extending outwardly therefrom. The tubular mounting may have at its upper

end an annular seat to accommodate a removable grid fitting. The top end of the receptacle is beneficially recessed to provide a seat for seals or sealing compounds. the seating positioned in use under the annular flange of the tubular mounting. The top end of the receptacle is desirably dished from its outer peripheral edge to the seat. Alternatively, the top end of the receptacle may be provided with an upstanding peripheral lip.

Preferably also, the elongate element is an upright spindle which passes through a central bore in the grid fitting, the elongate element having a shoulder on which the grid fitting rests with a projecting threaded portion engaged above the grid fitting by a nut. The bottom of the element has two diametrically-opposite, upwardly extending wings deformable inwardly to allow the float member which is cylindrical with a central passage to be pushed thereover for low friction movement up and down the spindle, the wings when not deformed preventing the float member from separating from the spindle.

Alternatively, the float member is elongate and is pivoted to the elongate element which is a mounting rod fitted through the wall surround of the receptacle, the elongate float member and the rod having contact elements in electric circuit with the power means, the elongate float member being movable between a position aligned with the mounting rod when the contacts are made and no water is present, and a position angled to the mounting rod when the contacts are broken and water is present, the power means being in electrical contact with the pump to respectively cut-off power to or energise the pump to remove any water.

The rod is desirably mounted on a support having a larger diameter and the end of the float member nearer the rod is preferably angled away from the pivot point to allow pivotal movement of the float member. The outer end of the float member

may also be angled, the angled ends converging, to maximise the possible extent of pivotal movement of the float member.

Preferably further, the inner end of the outlet pipe in the receptacle is fitted with a block having a curved passage whose outlet is downwardly extending towards the bottom of the chamber. Alternatively, the end of the outlet pipe in the receptacle may be curved downwardly towards the bottom of the chamber.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is a cross-sectional view of a shower drain trap according to a first embodiment of the present invention and showing a float member on a spindle at its lower position when no water is present;

Fig. 2 is a cross-sectional view of the shower drain trap similar to Fig. 1 and showing the float member on the spindle at an upper position when water is present;

Fig. 3 is a plan view of the shower drain trap showing leads extending out of the top of the spindle on which a removable grid fitting is mounted, the terminals of the leads extending into the spindle with contact between which being made by a magnetic element in the float member in its higher position;

Fig. 4 is a cross-sectional view of a shower drain trap according to a second embodiment of the present invention and showing a floating member in an aligned position and, in broken line, in a fully angled position;

Fig. 5 is a cross-sectional view of a first modified shower drain trap of the trap shown in Fig. 4; and

Fig. 6 is a cross-sectional view of a second modified shower drain trap of the trap shown in Fig. 4.

Referring to the drawings, a shower drain trap generally comprises a receptacle 10 having a wall surround 12 defining a chamber 14. The receptacle 10 is to be fitted under a drain outlet 16 of a shower and in communication therewith. An outlet pipe 18 is plumbed into the receptacle 10 and associated with a pump (not shown). A float switch 20 is accommodated in the chamber 14 and comprises a float member mounted on an elongate element and adapted for restricted movement relevant thereto, the elongate element having contact points in electric circuit with power means (not shown) and the pump (not shown), the contact points to be made or broken by the position of the float member relative to the elongate element and depending on whether water is present in the receptacle or not.

The receptacle 10 is of shallow cylindrical shape with closed ends and oriented with its axis upright, the top end 26 having a central threaded aperture 28 into which is fitted a tubular mounting 30 of the drain outlet 16. The tubular mounting 30 has an external thread to engage with the threaded aperture 28 and at its upper end an annular flange 32 extending outwardly therefrom. The tubular mounting 30 has at its upper end an annular seat 34 to accommodate a removable grid fitting 36. The grid fitting 36 has an annular wall 38 shaped to complement the seat 34 and across and near to the upper end of the wall 38 a grid member 40 is provided. The top end 26 of the receptacle 10 is recessed to provide a seat 42 for seals or sealing compounds, the seat 42 being positioned in use under the annular flange 32 of the tubular mounting 30. In Figs. 1, 2 and 5, the top end 26 of the receptacle is dished from its outer peripheral edge to the seat. In Figs. 4 and 6, the top end 26 is provided with an upstanding peripheral lip 44 whose top face, in installation, is flush with the top surface of the cement or the like used to install the trap and support the floor 46 of the shower or a shower tray.

In the first embodiment as shown in Figs. 1 to 3, the elongate element is an upright spindle 11 which passes through a central bore 13 in the grid fitting 36. The spindle 11 has a shoulder 15 on which the grid fitting 36 rests with a projecting threaded portion 11A engaged above the grid fitting by a nut 17. The bottom of the spindle 11 has two diametrically-opposite, upwardly extending wings 19 deformable inwardly to allow the float member 21 which is cylindrical with a central passage 23 to be pushed thereover for low friction movement up and down the spindle 11. The wings 19 when not deformed prevent the float member 21 from separating from the spindle 11. The elongate element has contact points in electric circuit with power means (not shown) and the pump (not shown). The threaded portion 11A and the spindle 11 as far as the shoulder 15 is hollow, and the leads 25 extend into the hollow of the spindle 11 with the contact points extending below the shoulder 15 such that electrical contact can be made by a magnetic element ie. a washer 27 in and positioned at the top of the float member 21 when it is in its higher position. The hollow in the spindle 11 and the leads 25 is filled with bitumen or similar material.

The inner end of the outlet pipe 18 in the receptacle 10 is fitted with a block 29 having a curved passage 31 whose outlet is downwardly extending towards the bottom of the chamber 14.

In use of this embodiment, a drain trap is fitted into the floor of the shower tray as shown with the flange 32 overlying the peripheral edge of the floor 46 and trapping it between the flange and the seat 42 with an annular seal 41 therebetween. When the shower is in use and water is passing into the trap, the float switch 20 is open with float member 21 at its higher position and pump on. When the water of the shower is turned off, the water level decreases, the float member 21 falls under

gravity to its lower position, and the pump stops ready for re-use when the water starts to flow.

In the second embodiment as shown in Figs. 4 to 6, and in which like parts are denoted by like numerals, the float member is elongate and is pivoted to the elongate element which is a mounting rod 24 fitted through the wall surround 12. The float member 22 and the rod 24 having contact elements (not shown) in electric circuit with a signalling generator and low voltage power means (not shown). The float member 22 is movable between a position aligned with the mounting rod 24 as (shown in the drawings in full line) when the contacts are made and no water is present, and a position angled to the mounting rod 24 (as shown in the drawings in broken line) when the contacts are broken and water is present. The signalling generator is in circuit with a relay switch (not shown) provided in a separate electric circuit between power means and the pump to respectively cut-off power to or energise the pump to remove any water on the float member being aligned or fully angled.

The mounting rod 24 is mounted on a support 48 having a larger diameter and the end 47 of the float member 22 nearer the rod 24 is angled away from the pivot point 50 to allow maximum pivotal movement of the float member 22 relative to the support 48. The outer end 49 of the float member 22 is also angled, the angled ends 47, 49 converging upwardly, to maximise the possible extent of pivotal movement of the float member 22.

The end of the outlet pipe 18 in the receptacle 10 is curved downwardly towards the bottom of the chamber 14.

In use of this embodiment, a drain trap is fitted into the floor of the shower as shown. The surface of the shower may be tiles, vinyl flooring or indeed a shower

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tray. Figs. 4 and 6 show vinyl flooring being used, the flange 32 overlying the peripheral edge of the floor 46 and trapping it between the flange and the seat 42.

When the shower is in use and water is passing into the trap, the float switch is open with float member angled and pump on. When the shower is stopped being used,

5 the water level decreases, the float member closes, and the pump stops ready for re-use when the water starts to flow.

Variations and modifications can be made without departing from the scope of the invention described above and as claimed hereinafter.

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CLAIMS

1. A shower drain trap comprising a receptacle having a wall surround defining
5 a chamber, the receptacle to be fitted under a drain outlet and in communication
therewith, an outlet pipe plumbed into the receptacle and associated with a pump, a
float switch being accommodated in the chamber of the receptacle and comprising a
float member mounted on an elongate element and adapted for restricted movement
relevant thereto, the elongate element having contact points in electric circuit with
10 power means and the pump, the contact points to be made or broken by the position
of the float member relative to the elongate element and depending on whether
water is present in the receptacle or not.
- 15 2. A shower drain trap as claimed in Claim 1, wherein the receptacle is of
shallow cylindrical shape with closed ends and oriented with its axis upright, the top
end having a central thread aperture into which is fitted a tubular mounting of the
drain outlet, the tubular mounting having an external thread to engage with the
threaded aperture and at its upper end an annular flange extending outwardly
20 therefrom.
3. A shower drain trap as claimed in Claim 2, wherein the tubular mounting has
at its upper end an annular seat to accommodate a removable grid fitting.

4. A shower drain trap as claimed in Claim 3, wherein the top end of the receptacle is recessed to provide a seat for seats or sealing compounds, the seat being positioned in use under the annular flange of the tubular mounting.

5. A shower drain trap as claimed in any one of Claims 1 to 4, wherein the elongate element is an upright spindle which passes through a central bore in the grid fitting, the elongate element having a shoulder on which the grid fitting rests with a projecting threaded portion engaged above the grid fitting by a nut.

6. A shower drain trap as claimed in Claim 5, wherein the bottom of the element has two diametrically-opposite, upwardly extending wings deformable inwardly to allow the float member which is cylindrical with a central passage to be pushed thereover for low friction movement up and down the spindle, the wings when not deformed preventing the float member from separating from the spindle.

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7. A shower drain trap as claimed in any one of Claims 1 to 4, wherein the float member is elongate and is pivoted to the elongate element which is a mounting rod fitted through the wall surround of the receptacle, the float member and the rod having contact elements in electric circuit with power means, the float member being movable between a position aligned with the mounting rod when the contacts are made and no water is present and a position angled to the mounting rod when the contacts are broken and water is present, the power means being in electrical contact with the pump to respectively cut-off power to or energise the pump to remove any water.

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8. A shower drain trap as claimed in any one of Claims 4 to 7, wherein the top end of the receptacle is dished from its outer peripheral edge to the seat.

9. A shower drain trap as claimed in any one of Claims 4 to 7, wherein the top
5 end of the receptacle is provided with an upstanding outer peripheral lip.

10. A shower drain trap as claimed in any one of Claims 7 to 9, wherein the rod
is mounted on a support having a larger diameter and an inner end of the float
member nearer the rod is angled away from the pivot point to allow pivotal
10 movement of the float member.

11. A shower drain trap as claimed in Claim 10, wherein an outer end of the float
member is also angled, the angled ends converging, to maximise the possible extent
of pivotal movement of the float member.

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12. A shower drain trap as claimed in any one of Claims 1 to 11, wherein the
inner end of the outlet pipe in the receptacle is fitted with a block having a curved
passage whose outlet is downwardly extending towards the bottom of the chamber.

20 13. A shower drain trap as claimed in any one of Claims 1 to 11, wherein the
inner end of the outlet pipe in the receptacle is curved downwardly towards the
bottom of the chamber.

14. A shower drain substantially as hereinbefore described with reference to
25 Figs. 1 to 3 or Figs. 4 to 6 of the accompanying drawings.



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 Claims searched: 1-14

Examiner: D. Haworth
 Date of search: 16 August 2001

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.S): A4N (NSK)(NSX)

Int CI (Ed.7): A47K 3/28; E03C 1/28

Other: Online: WPI, EPODOC, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2294636 A (Gontar)	
A	GB 2224777 A (Swain)	

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